

## Pycnogonids (Arthropoda: Pycnogonida) from the Great Australian Bight, southern Australia, with description of two new species.

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### Abstract

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Twelve species of shallow-water pycnogonid belonging to nine genera are represented in this report. Specimens were collected from the Great Australian Bight, southern Australia, at depths of 1–180 m. Two new species in the family *Callipallenidae* are described: *Pseudopallene chevron* sp. nov. and *Parapallene gowlettiae* sp. nov.

### Keywords

Pycnogonids, Southern Australia, Eyre Peninsula, Great Australian Bight, Nymphonidae, Ammotheidae, Callipallenidae, Phoxichilidiidae, Pycnogonidae, Austrodecidae.

### Introduction

This collection is mainly comprised of specimens from the west coast of the Eyre Peninsula, South Australia but also includes two species from West Australian waters. The most recent reports on pycnogonids collected from the region are those of Bamber (2005) who reported on the pycnogonids from the Recherche Archipelago, Esperance, Western Australia and Staples (2005; 2007) who reported on pycnogonids collected from two island groups in South Australian waters. The scarcity of reports on the pycnogonid fauna in the intervening region is largely a reflection of the exposed and inaccessible nature of that coastline. It is nevertheless expected that the coastal fauna is typical of a high energy regime and relatively sparse. Previous ship-based surveys have collected few specimens and the logistics of mounting future deep-sea surveys in the region represent a significant barrier to more intensive collecting.

Specimens are lodged in the South Australian Museum, Adelaide (SAM) and Museum Victoria (NMV).

### Nymphonidae Wilson, 1878

#### *Nymphon aequidigitatum* Haswell, 1884.

*Nymphon aequidigitatum* Haswell, 1884: 1022–1024, pl. 54, figs 1–5—Clark, 1963: 5–7, fig. 3—Stock, 1973a: 107–108—Staples, 1997: 1050, fig. 21.1a, 21.2c, plate 68.8.

*Material examined.* South Australia, W side of Wittelbee Point, E of Ceduna, 1–3 m, 7 Mar 1993; coll. W. Zeidler, K.L. Gowlett-Holmes and B. McHenry SAM E3675 (1 male).

*Type locality.* Port Jackson, New South Wales.

*Distribution.* Recorded from Gulf St. Vincent, South Australia to Cape Byron, New South Wales, from the intertidal to 20 m depth.

*Remarks.* The chelae of *N. aequidigitatum* are sexually dimorphic; the male palm more swollen than that of the female. The species is most often found on hydroids, algae, bryozoans and sponge surfaces. Colour is typically straw to pale orange but specimens predominantly assume the colour of their gut content. A narrow, pale mid-dorsal stripe is often present.

### Ammothidae Dohrn, 1891

#### *Achelia shepherdii* Stock, 1973b

*Achelia shepherdii*, Stock, 1973b: 92–95, figs 1–2—Staples, 1997: 1056; fig. 21.7e—Child, 1975: 22–24, fig. 10.

*Material examined.* S of Eucla, South Australia, Great Australian Bight, (31°50'E, 129°0'S), stn GAB 007, semi-epibenthic sled, 42 m, P. E. Bock and S. J. Hageman, 15 Jul 1995 SAM E3676 (1 male).

*Type locality.* Bruny I., Tasmania.

*Distribution.* Western Australia, South Australia, Victoria, Tasmania and east coast of Australia at depths to 50 m.

*Remarks.* This species is readily distinguished from its Australian congeners by the serrated appearance of the distal palp and possession of a bulbous proboscis.

### *Ammothaea australiensis* Flynn, 1919

*Ammothaea australiensis* Flynn, 1919: 95–99—Child, 1975: 24 (earlier refs.)—Staples, 1997: 1067; fig. 21.8b.

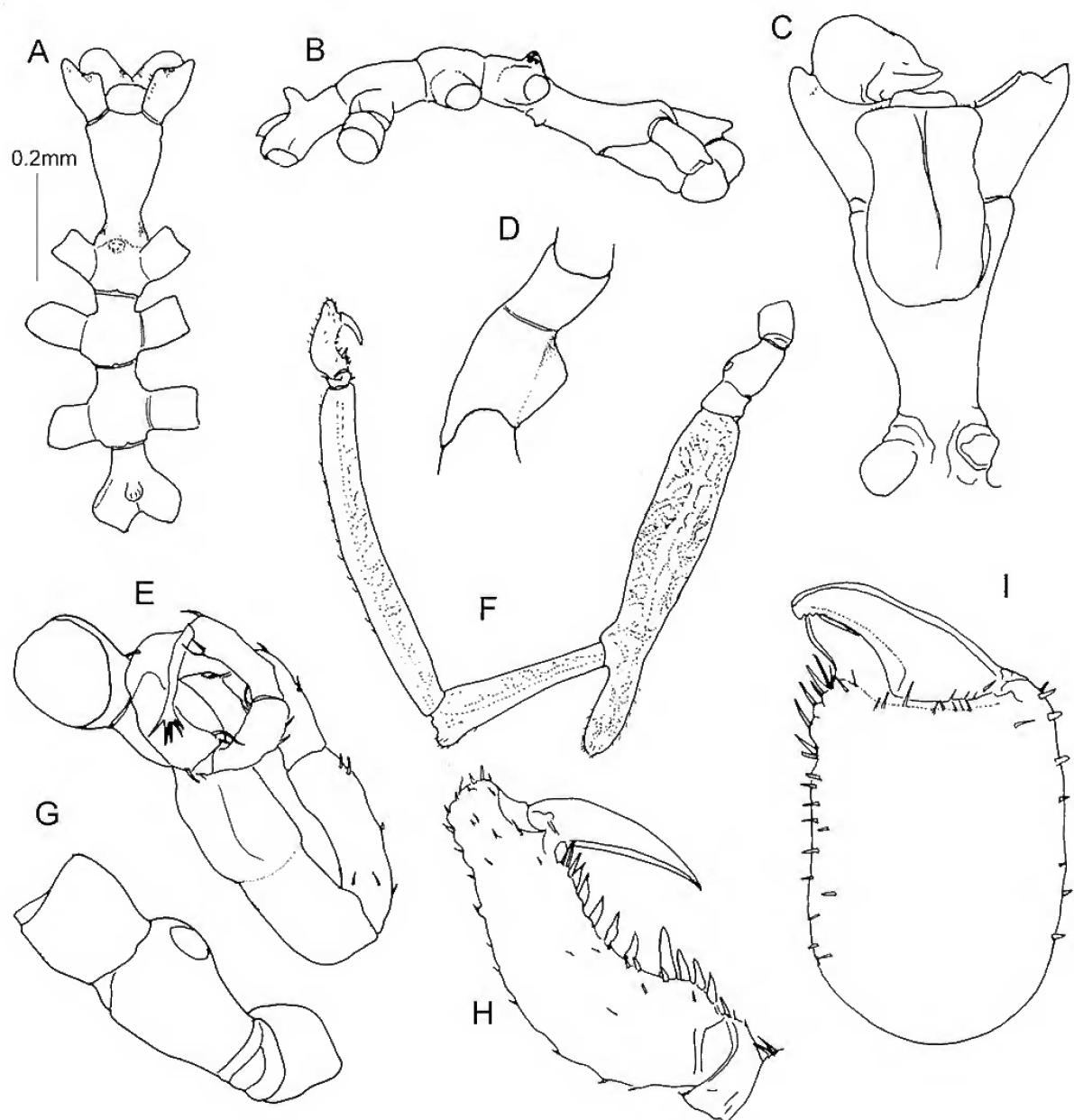


Figure 1 *Parapallene gowlettae* sp. nov. female holotype (SAM E3678): A, trunk, dorsal; B, trunk, lateral; C, cephalon, ventral; D, oviger segments 3 and 4; E, oviger; F, leg 1; G, coxae; H, propodus, leg 3; I, chela.

*Material examined.* Point Sinclair jetty, amongst *Galeolaria* tubes, D. Howlett, Jan 1980. SAM E3677 (1 subadult).

*Type locality.* Port Jackson, New South Wales.

*Distribution.* Garden I., WA to Port Jackson, NSW and Tasmania. Intertidally to 10 m depth.

*Remarks.* This small, subadult specimen possesses dorsal trunk tubercles characteristic of *A. australiensis*. This is the most common species along the southern Australian coastline, typically collected from beneath stable rocks and in association with the sedentary polychaete *Galeolaria caespitosa* on which it feeds.

**Callipallenidae** Hilton, 1942

**Parapallene** Carpenter, 1892

**Parapallene gowlettae** sp. nov.

Figure 1A–I

*Material examined.* Holotype: Elliston, in algae, S. A. Shepherd, 26 Feb 1978. SAM E3678 (1 female).

*Diagnosis.* Trunk slightly arched, smooth, fully segmented. Chelifore scape with prominent dorsodistal process. Ovigers 10-segmented, segments 5–7 lying parallel to segments 1–4, terminal claw divided into 5 finger-like processes. Femur with long distal process about one-third length of the segment, tarsus short, propodus strongly curved.

*Description.* Female holotype. Leg span about 35 mm. Trunk smooth, segmented, lateral processes 2 and 3 separated by about 1.3 times own basal diameters, lateral processes 1–3 separated from trunk by thin cuticular line, segment 4 divided dorsally by longitudinal cuticular line, posterior to the abdomen and extending ventrally, to the anterior margin of trunk segment 4; cephalon neck angled downwards from ocular tubercle, expanding distally. Ocular tubercle conical, positioned over anterior margin of 1st lateral processes, 2 sensory organs prominent; 4 eyes lightly pigmented in preserved specimen. Abdomen curved, fusiform, positioned on dorsal surface of segment 4, short, erect, not visible from ventral aspect, strongly cleft, small papillae either side of anal slit. Proboscis short, attached to ventrodistal surface of cephalon, basal region barrel-shaped with tiny spines on ventral surface, strongly constricted prior to inflated oral region, oral surface bearing numerous tiny spines, lips protruding. Chelifore scape with prominent dorsodistal process bearing scattered spinules, inner surface with few spines; chela palm almost oblong, inflated, with numerous small, scattered spinules; fingers short, off-set from distal margin of palm, moveable finger longest, with tiny, but well-defined crenulations distally. Ovigers 10-segmented, attached to ventrolateral surfaces of neck, immediately below the anterior margin of the 1st lateral processes; segments 5–7 folded back, lying parallel with segments 1–4, strigilis resting beneath basal segments; segment 1 longer than segment 2, segment 3 significantly swollen, more-so on the outside surface, separated from segment 4 by faint suture line, segments 5 and

6 each with a small dorsodistal swelling, segments 7–10 with 2 long, strongly curved ventral spines and 4 smaller dorsal spines; terminal claw about 1.3 times as long as segment 9, without crenulations or serrations, distally, the claw divides into 5 pointed finger-like processes, one of which is bifurcate. The 2nd leg is the only intact, complete leg and is used for measurements: coxa 2, 1.2 times length of coxa 1; femur having a long, distal process almost equal to one-third the length of entire segment and more or less continuous with the median line of the femur, numerous small setae distally; tibia 1 slightly curved, with similar but shorter dorsodistal process, shorter than femur or tibia 2; tibia 2 more slender than tibia 1; tarsus short; propodus curved, extended distally, overreaching base of claw; heel variably defined but not prominent, bearing 3–4 strong spines, distal spine longest; sole armed with about 5 strong spines in mid-region accompanied by smaller lateral spines, all spines finely crenulated. Genital pores large, placed on swollen ventrodistal surface of coxa 2 in all legs.

Measurements of holotype (mm): trunk length (frontal margin of cephalon to tip of 4th lateral process), 7.40; width (across second lateral processes), 2.85; proboscis length (ventral), 1.64; 2nd leg; coxa 1, 0.88; coxa 2, 1.38; coxa 3, 0.73; femur, 3.7; tibia 1, 2.13; tibia 2, 5.20; tarsus, 0.13; propodus, 1.90; claw, 0.70.

*Etymology.* Named for Karen Gowlett-Holmes in recognition of her collecting and astute observations of the southern Australian pycnogonid fauna.

*Remarks.* The exoskeleton of this specimen is partially transparent, revealing a fibrous and diverticulate network of underlying tissue or cuticle. If this feature is evident in live material, it will prove to be a useful diagnostic character. The swollen oviger segment 3 is reminiscent of the similarly swollen segment 6 in several species of *Endeis* (Staples, 1982: 461).

Three species share a distal process on the femur and tibia 1: *Parapallene avida* Stock, 1973; *P. famelica* Flynn, 1929 and *P. haddoni* Carpenter, 1892. In all 3 species the distal femoral processes are much shorter than in *P. gowlettae* and none share the pointed, finger-like processes on the oviger claw. *Parapallene avida* can further be distinguished by the shape of the chelifores and spination of the leg segments; the lateral processes of *P. famelica* (non Clark, 1963) are separated by about 4 times their own width and *Parapallene haddoni* has a much longer abdomen.

**Parapallene australiensis** (Hoek, 1881)

*Pallene australiensis* Hoek, 1881: 76–78, pl. 11: figs 1–7.

*Parapallene australiensis* Stock, 1991: 190 (earlier refs) — Staples, 1997: 1057, fig. 21.4e pl. 67.2, 68.3.

*Material examined.* Great Australian Bight, approx 96 nm SW of Elliston, (34° 54.13'S, 133° 42.68'E), 180 m epibenthic sled, RV *Franklin*, stn PL 94/08–09, 27 Jun 1994, K. L. Gowlett-Holmes, S. Hagman, Y. Bone, SAM E3679 (1 male).

*Type locality.* East Moncoeur I., Bass Strait, Tasmania.

*Distribution.* Cape Naturaliste WA, along the east coast, north to Cape York and New Caledonia at depths 10–240 m.

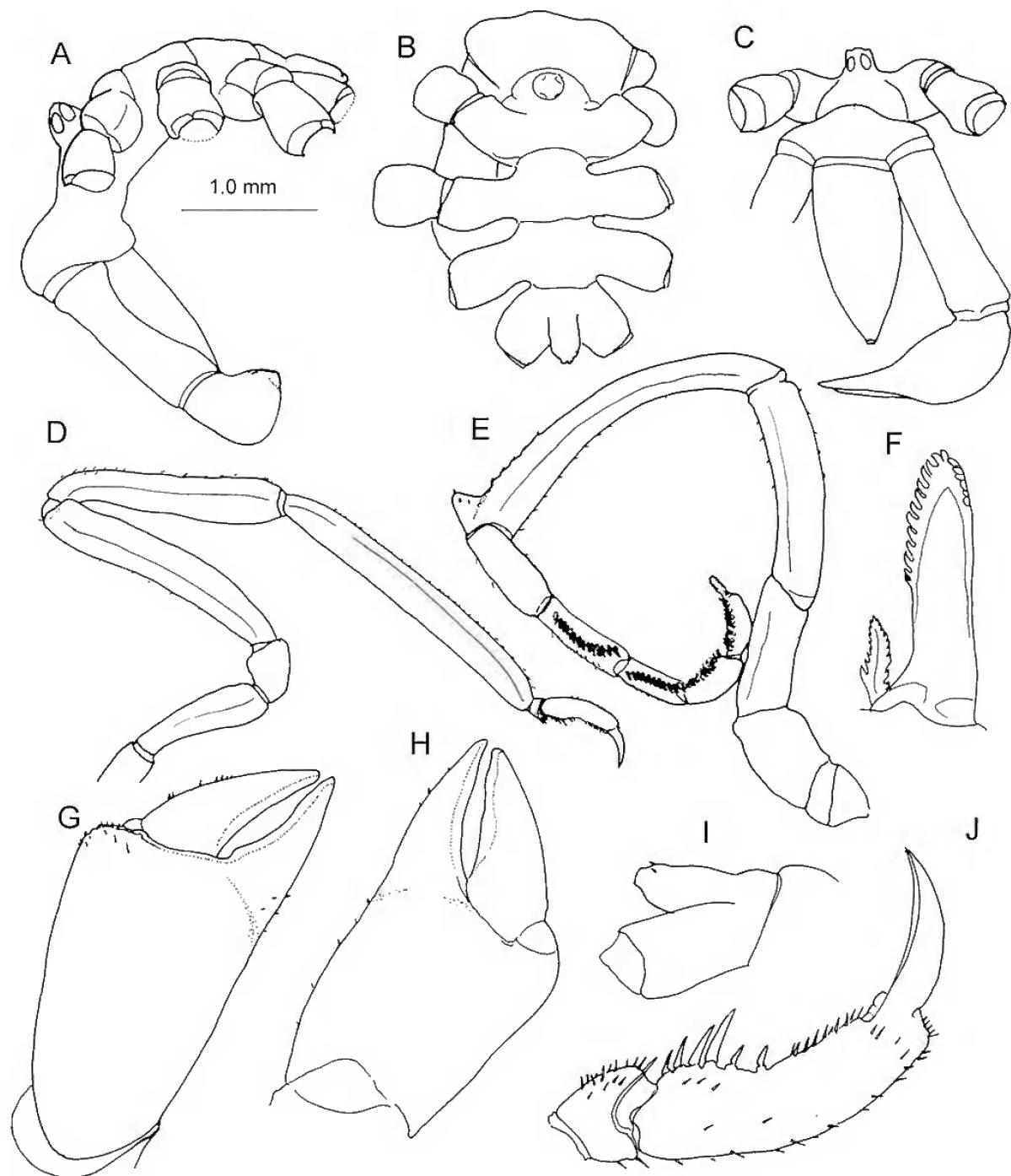


Figure 2 *Pseudopallene chevron* sp. nov. male holotype (SAM E3681): A, trunk, lateral; B, trunk, dorsal; C, trunk, anterior; D, leg 2; E, oviger; F, oviger claw; G, chela exterior; H, chela interior; I, abdomen lateral; J, tarsus and propodus leg 4.

**Remarks.** The proboscis of this specimen is missing. Colour and markings of live specimens are variable. In southern Australia, this seasonally abundant species is typically uniformly scarlet in colour, matching the hydroid *Halopteris glutinosa*, on which it feeds (Staples, 1997).

#### **Pseudopallene** Wilson, 1878

##### **Pseudopallene reflexa** (Stock, 1968)

*Spasmopallene reflexa* Stock, 1968: 40–42, fig. 15a–h.

*Pseudopallene reflexa* Staples, 2005: 164–166, fig. 4A–I, fig. 5 F, G.

**Material examined.** Southern Eyre Peninsula, Point Drummond, exposed, 5 m, site 14, code 56, 3 Dec 1995 SAM E3680 (1 male with eggs, 2 females).

**Type locality.** *Galathea* stn. 571, Great Australian Bight.

**Distribution.** Investigator Group, Port Phillip Bay, Victoria and southeast coast of Australia at depths 3–72 m.

**Remarks.** This species is most readily distinguished from its congeners by the paired arrangement of the propodal heel spines.

#### **Pseudopallene** Wilson, 1878

##### **Pseudopallene watsonae** Staples, 2005

Staples 2005: 160–164, fig. 2A–I.

Western Australia, King George Sound, N of False Bay, on red algae, bryozoa from rock face, 27 m, SCUBA, G. C. B. Poore and H. M. Lew Ton, 15 Apr 1984 (Stn SWA 57) NMV J45348 (1 female).

**Type locality.** Althorpe I., South Australia.

**Distribution.** King George Sound, Western Australia; Althorpe I., South Australia; Port Phillip Bay, Victoria.

**Remarks.** The shape of the chelifore fingers is the most recognizable character separating this species from its congeners. Specimens are uniformly yellow in life. This is a much smaller and finer species than the similarly coloured *P. ambigua*.

#### **Pseudopallene** Wilson, 1878

##### **Pseudopallene chevron** sp. nov.

Figure 2A–J

**Material examined.** 1 male, holotype, Waldergrave I., 25 m, 25 Oct 1973 SAM E 3681.

**Diagnosis.** Trunk smooth, completely segmented. Post-ocular surface of cephalon evenly rounded, not divided longitudinally, mid-dorsal mound not present. Abdomen more or less tubular. Proboscis bullet-shaped, without constrictions, margins evenly curved and tapered towards tip. Oviger terminal claw scooped, margin lined with rounded teeth. Red chevron markings on trunk may be a useful diagnostic character.

**Description.** Leg span about 27.0 mm. Trunk smooth, completely segmented; neck region of cephalon sloping away from base of ocular tubercle; post-ocular surface evenly

rounded, not divided longitudinally, mid-dorsal mound not present; length of lateral processes about 1.5 times maximum width, 1st and 2nd pair separated by about one-quarter of basal widths. Ocular tubercle with 2 prominent dorsal papillae, lateral sensory organs not evident; 4 eyes, darkly pigmented. Abdomen more or less tubular, constricted distally, cleft anal opening. Proboscis bullet-shaped, without constrictions, margins evenly curved and tapered towards tip, 3 lips prominent, extended, oral fringe not evident. Chelifore scape without basal constriction, chela fingers with linear cutting edge, length of moveable finger slightly less than length of palm, dorsal surface of immovable finger with several strong setae on outer surface. Oviger 10-segmented, segment 5 longest, strongly curved, distal apophysis prominent, all segments covered in small, but strong, simple spines; compound spine formula segments 7 to 10, 14:11:10:10, terminal claw scooped, margin lined with 22–26 rounded teeth. 3rd leg: coxa 2, 2.5 times length of coxa 3, tibia 2 longest, femur longer than tibia 1, propodus with 4 strong heel spines, distal-most spine longest, greater than half width of heel, heel spines followed by 2 lesser spines followed by 10–15 much smaller sole spines. Genital pores round, tiny, on ventrodistal surface of legs 3 and 4.

**Measurements of holotype** (mm): trunk length (frontal margin of cephalic segment to tip of 4th lateral process), 3.5; width (across 2nd lateral processes), 1.55; proboscis length (dorsal), 1.20; 3rd leg: coxa 1, 0.55; coxa 2, 1.38; coxa 3, 0.55; femur, 3.05; tibia 1, 2.64; tibia 2, 3.75; tarsus, 0.25; propodus, 0.85; claw, 0.48.

**Remarks.** This small species is of a similar size to *P. reflexa* Staples, 2005 with which it shares the absence of a preocular mound and the longitudinal division of the cephalon. It otherwise differs in the arrangement of the propodal heel spines, the shape of the proboscis and abdomen and not having an irregular surface of the legs. The evenly rounded preocular region of the cephalon also resembles that of the much larger and more robust *P. ambigua* but from which it also differs conspicuously in the shapes of the proboscis, the chelifores, the oviger claw and the propodus. It is of interest to note that Bamber (2005: 332) records markings on the trunk and legs of *P. ambigua* from the Recherche Archipelago; a feature uncharacteristic of specimens from southeastern Australia where they are uniformly yellow. Photographs of live *P. chevron* show colour to be predominantly yellow with red markings. Although this preserved specimen has lost all trace of colour, dark V-shaped markings persist on the trunk and a median line extends dorsally along the lateral processes and femur. Bandings on the tibiae, the chelae and part of the cephalon indicate that these areas also were pigmented, perhaps providing useful diagnostic character in live material. This is a common species of *Pseudopallene* in South Australian waters (pers. com. Karen Gowlett-Holmes).

**Distribution.** Based on photographic records of live specimens, this species may be widely spread in SE Australia.

**Etymology.** Named for the V-shaped dorsal trunk markings (chevrons) which, in combination with the leg markings, appear to be a distinctive diagnostic character; a noun in apposition.

***Pycnothea*** Loman, 1921***Pycnothea flynni*** Williams, 1940

Williams, 1940: 202–204, figs 6–9—Clark, 1963: 46–48, fig. 23—Arnaud, 1972: 160–161, fig. 2—Stock 1973a: 121—Child, 1975: 16, fig. 6—Hooper, 1980: 475—Child, 1992: 30—Staples 1997: 1058, fig. 21.5b.

*Material examined.* Wittelbee Point, near Ceduna; 9 Aug 1974; coll. W. Zeidler. SAM E3682 (1 specimen).

*Type locality.* Rottnest I., Western Australia.

*Distribution.* Madagascar; Pelsart I., Western Australia; South Australia; Victoria; Tasmania; New South Wales, Indo-Pacific. Intertidal to 50 m depth.

*Remarks.* Genital pores are not evident, suggesting that this specimen may be sub-adult.

***Phoxichiliidae*** Sars, 1891***Anoplodactylus*** Wilson, 1878***Anoplodactylus evansi*** Clark, 1963

*Anoplodactylus evansi* Clark, 1963: 51–53, fig. 26 A–G—Stock, 1973: 121–122 fig. 10b—Staples, 1997: 1063 fig. 21.6 pl. 67.5—Bamber, 2005: 338.

*Material examined.* Point Brown, coralline, rock, 10 m, H. Kirkman SAM E3683 (1 male).

*Type locality.* Port Jackson, New South Wales.

*Distribution.* West I., South Australia to Tweed Heads, Queensland and Tasmania. Intertidal to 16 m depth.

*Remarks.* A particularly colourful species most often collected from amongst red algae in southern Australia (Poore, 2006).

***Austrodecidae*** Stock, 1954***Austrodecus*** Hodgson, 1907***Austrodecus (Austrodecus) staplesi*** Stock 1990

*Austrodecus staplesi* Stock 1990: 269–271, figs 1–8—Bamber 2005: 339–340.

*Austrodecus tubiferum* Staples 1997: 1068, fig. 21.8d.

*Material examined.* Western Australia, south of Esperance (34°32'S, 123°40'E), 80 m, epibenthic sled, stn GAB 087, 23 Jul 1995, P. E. Bock NMV J56094 (1 male).

*Type locality.* Split Solitary I., New South Wales.

*Distribution.* Esperance Bay, Western Australia and along the southeast coast to Coffs Harbour, New South Wales and Tasmania. Depth 14–30 m.

*Remarks.* This single male is assigned to this species on the basis of the propodus being longer than tibia 2, the location of the cement gland tube on the mid-ventral surface of the femur, the absence of auxiliary claws and possession of 4-segmented ovigers.

***Pycnogonidae*** Wilson, 1878***Pycnogonum*** Brünnich, 1764***Pycnogonum (Retroviger) aurilineatum*** Flynn, 1919b

*Pycnogonum aurilineatum* Flynn, 1919: 92–95, X111, figs 1–2, pl. XIV fig. 3—Stock, 1973a: 125—Staples, 1997: 1068–1070, fig. 21.8e, pl. 68.5—Staples, 2002, 549–552, fig. 4A–H.

*Material examined.* Four Hummocks I. 10 m. shelf, site 16, code 64 bag. H. Kirkman, 3 Dec 1995. SAM E3684 (1 female).

*Type locality.* Port Arthur, Tasmania.

*Distribution.* Investigator Group, Great Australian Bight, South Australia; Victoria; SE Tasmania to Coffs Harbour, New South Wales. Intertidal to 23 m.

*Remarks.* This species is readily recognized by possession of a pale, mid-dorsal stripe.

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